PATENT ABSTRACTS OF JAPAN

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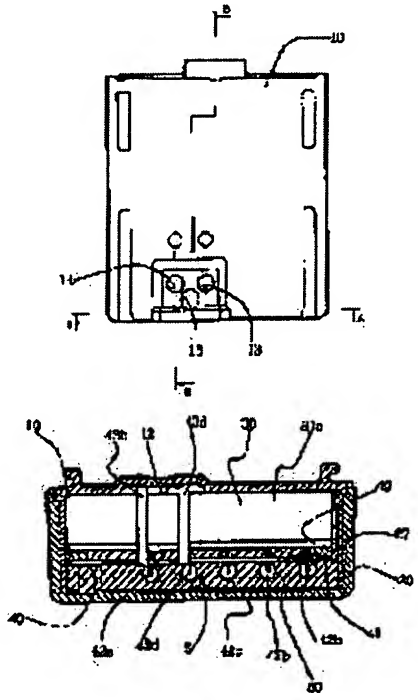
(71)Applicant : KOKUSAI ELECTRIC CO LTD
(72)Inventor : SHIRASU MITSUO
MOTOJIMA SHUJI
SUZUKI YOSHINORI

(54) BATTERY PACK AND ITS MANUFACTURE

(57)Abstract:
PURPOSE: To provide a battery pack capable of being easily manufactured by use of widely available and inexpensive parts in which highly reliable explosion-proof property can be provided, and the internal structure can be miniaturized together with simplification, and a method for manufacturing it.
CONSTITUTION: After a set battery 30 consisting of a plurality of batteries 31 and a power limiting circuit 40 having a plurality of resistors 42 on a printed board 41 are assembled together, and mounted on a case body 10, a case lid body 20 is fixed to the case body 10 to cover the set battery 30 and the power limiting circuit 40, and terminals 43a, 43b connected to the set battery 30 through the power limiting circuit 40 are opposed to the outer surface of the case body 10. An elastomer 50 is then injected through an injection hole 15 formed in the case body 10, and filled in a space S around the resistors 42 of the power limiting circuit 40 to cover the resistors 42, so that they are isolated from the outer part, and the backlash of the resistors 42 is suppressed.



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CLAIMS

[Claim(s)]
[Claim 1] In the cell pack which made said housing outside surface expose the terminal which held the power limiter and cell which have a power-restrictions component in the housing constituted by attaching a case body and a case lid, and was connected to this cell through said power limiter at the serial The cell pack characterized by having been filled up with the elastomer at least in said housing between this housing inner surface and the power-restrictions component of said power limiter, and covering said power-restrictions component with this elastomer.
[Claim 2] The power pack according to claim 1 characterized by coming to carry out parallel connection of two or more resistance by which said power limiter separated spacing to the substrate, and was arranged.
[Claim 3] After attaching in a case body the cell by which the substrate with which the power-restrictions component was mounted was attached to the cell, and this substrate was attached, a wrap case lid is fixed to this case body for said cell and power-restrictions component. Subsequently The manufacture approach of the cell pack characterized by blockading said inlet by plug part material after pouring in an elastomer from the inlet formed in either [at least] said case body or said case lid and filling up the surroundings of said power-restrictions component with this elastomer.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] this invention -- a portable walkie-talkie etc. -- attachment and detachment -- the cell pack used attaching exchangeable and its manufacture approach -- it is especially related with the cell pack and its manufacture approach of an explosion-proof construction.
[Description of the Prior Art]
[0002] If it is in the field radio used under the environment where an inflammable solvent etc. is intermingled, it is indispensable to aim at generating of a spark and the control of a temperature rise leading to explosion, and the cell pack is also constituted by the explosion-proof construction. Conventionally, as this kind of an explosion-proof type cell pack, one power-restrictions components, such as a power former wound line resistor and a power mold metal film resistor, are connected to a cell at a serial, it holds in a housing, and the thing which the terminal connected with the cell through the power-restrictions component on the outside surface of this housing was made to face is known.
[0003]
[Problem(s) to be Solved by the Invention] However, if it was in the conventional explosion-proof type cell pack mentioned above, the backlash which fixes power-restrictions components, such as a resistor, to a cell or a housing firmly, and causes spark generating had to be controlled, the fastener for immobilization of a power-restrictions component is indispensable, and the internal structure made it complicated, and there was a problem that the number of erectors at the time of manufacture also increased. There are the resistor which can use since one power-restrictions component is used, if it is in the conventional explosion-proof type cell pack especially mentioned above, and a problem that where of it is limited to special resistors, such as an axial lead form where a dimension is big, etc., acquisition of the resistor itself is difficult, and it is difficult to acquire the heat-dissipation property which should cause enlargement of a housing, should also concentrate the generation of heat further, and it not only produces evils, such as a late delivery, but should be satisfied.
[0004] On the other hand, although it is thought that the latter problem is solvable by carrying out parallel connection of the small power-restrictions component, and using it, when two or more power-restrictions components are used, a mutual interference must also be prevented, and the former problem becomes remarkable. This invention aims at offering the cell pack with which it was made in view of the above-mentioned trouble, and simplification of a internal structure can be attained, and it can miniaturize, and a big degree of freedom is obtained by the design of a housing etc., and enabling manufacture of this cell pack using the multi-use parts which circulate widely.
[0005]
[Means for Solving the Problem] In order to attain the above-mentioned object, a cell pack according to claim 1 In the cell pack which made said housing outside surface expose the terminal which held the power limiter and cell which have a power-restrictions component in the housing constituted by attaching a case body and a case lid, and was connected to this cell through said power limiter at the serial It was filled up with the elastomer at least in said housing between this housing inner surface and the power-restrictions component of said power limiter, and said power-restrictions component was covered with this elastomer.
[0006] Moreover, the cell pack according to claim 2 was constituted in the mode which comes to carry out parallel connection of two or more resistance by which said power-restrictions component separated spacing to the substrate, and was arranged.
[0007] Moreover, the manufacture approach of the cell pack concerning invention according to claim 3 After attaching in a case body the cell by which the substrate with which the power-restrictions component

was mounted was attached to the cell, and this substrate was attached, a wrap case lid is fixed to this case body for said cell and power-restrictions component. Subsequently After pouring in the elastomer from the inlet formed in either [at least] said case body or said case lid and filling up the surroundings of said power-restrictions component with this elastomer, it was made to blockade said inlet by plug part material.

[0008]

[Function] Since the surroundings of power-restrictions components, such as a resistor, are filled up with an elastomer, reliable explosion protection nature is attained since this elastomer is isolated from the exterior in a power-restrictions component, and an elastomer controls the backlash of a power-restrictions component etc., the cell pack concerning invention according to claim 1 can have an unnecessary fastener to prevention of the backlash of a power-restrictions component, can simplify a internal structure to it, and can also lessen the number of erectors at the time of manufacture further.

[0009] And since the cell pack concerning invention according to claim 2 carries out parallel connection of two or more small resistors etc., the small cheap resistor which circulates widely can be used, and the heat dissipation property which could distribute the generation of heat as these power limiter, and was excellent is acquired, and it can attain a miniaturization as the whole cell pack further.

[0010] Moreover, since the manufacture approach of the cell pack concerning invention according to claim 3 pours in an elastomer where it could perform assembly (manufacture) and a wrap case lid is fixed to a case body for said cell and power-restrictions component, and it fills up the surroundings of a power-restrictions component with it, without taking immobilization of a power-restrictions component into consideration, its shaping of an elastomer etc. is unnecessary and it can perform restoration easily.

[0011]

[Example] Hereafter, the example of this invention is explained with reference to a drawing. Drawing 5 shows the cell pack concerning one example of this invention from drawing 1 , and, for a top view and drawing 3 , the A-A view sectional view of drawing 2 and drawing 4 are [drawing 1 / a decomposition perspective view and drawing 2 / the B-B view sectional view of drawing 2 and drawing 5] electrical diagrams.

[0012] In drawing 1 -4, a case body abbreviation rectangle plate-like in 10 and 20 are the case lids of the shape of an abbreviation rectangular pipe in which the whole surface carried out opening, and these case body 10 and the case lid 20 are fabricated with injection molding of ABS plastics etc. The fitting protruding line 11 is formed in an inner surface periphery, and the rectangle-like crevice 12 is formed in an inner surface 1 side, a front flesh side is penetrated to this crevice 12, and two terminal derivation holes 13 and 14 and impregnation holes 15 carry out opening to the case body 10. The case lid 20 is energized with a spring 22 in this lock hole 21 by a 1 side outside surface's projecting and forming the lock hole 21 in this projection part, and the lock button 23 for immobilization to the body of a walkie-talkie etc. is held. These case body 10 and the case lid 20 constitute the cell pack housing with which the opening edge of the case lid 20 is attached in the fitting protruding line 11 of the case body 10, and holds the group cell 30 and the load limitation circuit (load limitation machine) 40. In addition, in drawing 1 , 19 is plug part material which blockades the impregnation hole 15, and the impregnation hole 15 is blockaded by the plug part material 19 after impregnation of an elastomer so that it may mention later.

[0013] The group cell 30 has four cell 31a of a rectangular parallelepiped configuration, and b, c and d (it represents with a number without a subscript hereafter), and these cells 31 are connected to a serial (refer to drawing 5). As for this group cell 30, three cell 31a, and b and c form the space S which 31d of cells is arranged on cell 31a at a plane, and the end face of these cells 31 is combined by the plate 32, respectively, and holds the load limitation circuit 40 between the case lids 20 on cell 31b and c. A plate 32 is fabricated by tabular from a fiber, FRP, etc., and is fixed to the electrode of the cell 31 by which the edge adjoins, respectively etc. In addition, it is also possible to constitute so that an electric conduction foil etc. may be formed in a plate 32 at the whole surface and each cell 30 may be connected electrically, and although it is not necessary to state, each cell 31 can also carry out parallel connection, and the number of cells 31 can also be set to arbitration.

[0014] In Space S, the load limitation circuit 40 is formed through an electric insulating plate 49 on cell 31b of the group cell 30, and c, and the surroundings of this load limitation circuit 40 are filled up with an elastomer 50. The load limitation circuit 40 prepares five metal coat fixed-resistors (load limitation component) 42a, b, c, d and e, and two terminal 43a and b (it represents with the number which does not have a subscript if needed) in a printed circuit board 41, and is constituted, and two places of a conductive part (a slash is attached and an insulating part is shown) are connected with the electrode of plus of the group cell 30, and minus by the lead member 47, respectively. On a printed circuit board 41, a metal film resistor 42 separates predetermined spacing, and is put in order and arranged, and parallel connection is carried out (refer to drawing 5). [each other] Terminals 43a and b separate spacing and

expose the flank of cell 31c to the exterior from the terminal derivation holes 13 and 14 extended and mentioned above to the case body 10 side in parallel. Among these terminals 43a and 43b, the gap (it is described as a free passage way for convenience) which opens for free passage the impregnation hole 15 mentioned above in the side part of cell 31c and Space S is formed.

[0015] In addition, although the load limitation circuit 40 mentioned above consists of five metal coat fixed resistors 42, this metal coat fixed resistor 42 is possible also for substituting other wire wound resistors etc., and can also set that number to arbitration in the two or more range. Moreover, although a graphic display and detailed explanation are omitted, it is also possible to carry out opening of the hole for [to the location of the impregnation hole 15 and an opposite hand] the air vents at the time of elastomer 50 restoration in the space S mentioned above. Furthermore, the inlet 15 mentioned above can also be formed [also forming in the case lid 20, and also] in the both sides of the case body 10 and the case lid 20.

[0016] An elastomer 50 is constituted so that it may consist of thermoplastic elastomer, such as a styrene system, an olefin system, or a vinyl chloride system, and it may consist of things of the silicone system excellent in thermal conductivity desirably and it may have big heat capacity desirably. It fills up with this elastomer 50 in Space S, and it covers the printed circuit board 41 table flesh side, especially its metal coat fixed resistor 42 of the load limitation circuit 40. This elastomer 50 is poured in from the impregnation hole 15, and it fills up with it in Space S through the free passage way between terminal 43a mentioned above and 43b so that it may explain in full detail behind.

[0017] In addition, the covering device material which 18 become from ABS plastics etc., and 27 and 28 are spacers which consist of a bakelite etc. among drawing.

[0018] If it is in this example, it is assembled in the following procedures. First, the load limitation circuit 40 is attached to the group cell 30, and it is wired. That is, on cell 31b and c, the lead member 45 is soldered to the conductive part of installation and a printed circuit board 41, and the printed circuit board 41 in which the metal coat fixed resistor 42 of the load limitation circuit 40 was mounted is connected with the group cell 30. In addition, although it is sufficient even for even laying a printed circuit board 41 through an electric insulating plate 49 on the group cell 30 at this time, it is also possible to fix a substrate 41 to the group cell 30.

[0019] Next, the group cell 30 by which the load limitation circuit 40 was attached is fixed on the case body 10, and the case lid 20 is fixed on the case body 10 installation and after this. That is, apply adhesives to the protruding line 11 grade of the case body 20, opening of the case lid 20 is made to attach in this protruding line 11, and it pastes up with adhesives. Subsequently, an elastomer 50 is poured in from the inlet 15 of the case body 10. Here, the elastomer 50 poured in from the inlet 15 flows in Space S through the free passage way between terminal 43a and 43b, is filled up with the inside of Space S, and covers the substrate 41 metallurgy group coat fixed resistor 42 of the load limitation circuit 40. Then, the plug part material 19 is attached in an inlet 15, and an inlet 15 is blockaded. Therefore, an elastomer 50 can be manufactured without taking shaping etc. into consideration, and the manufacture can be performed by easy and small manday.

[0020] And the cell pack manufactured as mentioned above Five metal coat fixed resistors 42 are pressed down by the elastomer 50 with which it filled up in Space S. A mutual interference, a backlash, etc. are prevented, can prevent generating of the spark resulting from these backlashs etc. certainly, and high explosion protection nature is obtained. moreover, since the metal coat fixed resistor 42 is isolated from the exterior by the elastomer 50, reliable explosion protection nature obtains -- having -- further -- immobilization of the metal coat fixed resistor 42 -- public funds -- an implement is unnecessary, and assembly is also easy, as cutback of components mark and simplification of a internal structure can be attained and being mentioned above.

[0021] Moreover, this cell pack can use the resistor 42 which the heat dissipation property which could distribute generation of heat of the load limitation circuit 40, and was excellent is acquire in order to carry out parallel connection of the five metal coat fixed resistors 42 and to use them, it can miniaturize, and a big degree of freedom is further obtain by the design of the configuration of a housing etc., and also circulates widely, and can attain shortening of a delivery date, and low cost-ization.

[0022]

[Effect of the Invention] Since the elastomer with which the surroundings of power-restrictions components, such as a resistor, were filled up is isolated from the exterior in a power-restrictions component according to invention according to claim 1 as explained above, reliable explosion protection nature is attained, and the backlash of a power-restrictions component etc. can also be controlled, a fastener is unnecessary to prevention of the backlash of a power-restrictions component, a internal structure can be simplified, and the effectiveness that the number of erectors at the time of manufacture can also be lessened is acquired further.

[0023] Moreover, in order to carry out parallel connection of two or more small resistors etc. according to invention according to claim 2, the small cheap resistor which circulates widely can be used, and shortening and low-cost-izing of a delivery date can be attained, and the heat dissipation property which could distribute generation of heat of these resistors etc. and was excellent is acquired, and the effectiveness that the miniaturization as the whole cell pack can be attained is acquired further.
[0024] Moreover, the effectiveness that according to invention according to claim 3 shaping of an elastomer etc. is unnecessary, restoration can be performed easily and it can be easily performed by manday with little manufacture of a cell pack since an elastomer is poured in where it could perform assembly and wrap covering device material is fixed to a case body for said cell and power-restrictions component, and the surroundings of a power-restrictions component are filled up, without taking immobilization of a power-restrictions component into consideration is acquired.

[Translation done.]

TECHNICAL FIELD

[Industrial Application] this invention -- a portable walkie-talkie etc. -- attachment and detachment -- the cell pack used attaching exchangeable and its manufacture approach -- it is especially related with the cell pack and its manufacture approach of an explosion-proof construction.

[Translation done.]

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PRIOR ART

[Description of the Prior Art]
[0002] If it is in the field radio used under the environment where an inflammable solvent etc. is intermingled, it is indispensable to aim at generating of a spark and the control of a temperature rise leading to explosion, and the cell pack is also constituted by the explosion-proof construction. Conventionally, as this kind of an explosion-proof type cell pack, one power-restrictions components, such as a power former wound line resistor and a power mold metal film resistor, are connected to a cell at a serial, it holds in a housing, and the thing which the terminal connected with the cell through the power-restrictions component on the outside surface of this housing was made to face is known.

[Translation done.]

EFFECT OF THE INVENTION

[Effect of the Invention] Since the elastomer with which the surroundings of power-restrictions components, such as a resistor, were filled up is isolated from the exterior in a power-restrictions component according to invention according to claim 1 as explained above, reliable explosion protection nature is attained, and the backlash of a power-restrictions component etc. can also be controlled, a fastener is unnecessary to prevention of the backlash of a power-restrictions component, a internal structure can be simplified, and the effectiveness that the number of erectors at the time of manufacture can also be lessened is acquired further.
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[Translation done.]

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, if it was in the conventional explosion-proof type cell pack mentioned above, the backlash which fixes power-restrictions components, such as a resistor, to a cell or a housing firmly, and causes spark generating had to be controlled, the fastener for immobilization of a power-restrictions component is indispensable, and the internal structure made it complicated, and there was a problem that the number of erectors at the time of manufacture also increased. There are the resistor which can use since one power-restrictions component is used, if it is in the conventional explosion-proof type cell pack especially mentioned above, and a problem that where of it is limited to special resistors, such as an axial lead form where a dimension is big, etc., acquisition of the resistor itself is difficult, and it is difficult to acquire the heat-dissipation property which should cause enlargement of a housing, should also concentrate the generation of heat further, and it not only produces evils, such as a late delivery, but should be satisfied.
[0004] On the other hand, although it is thought that the latter problem is solvable by carrying out parallel connection of the small power-restrictions component, and using it, when two or more power-restrictions components are used, a mutual interference must also be prevented, and the former problem becomes remarkable. This invention aims at offering the cell pack with which it was made in view of the above-mentioned trouble, and simplification of a internal structure can be attained, and it can miniaturize, and a big degree of freedom is obtained by the design of a housing etc., and enabling manufacture of this cell pack using the multi-use parts which circulate widely.

[Translation done.]

MEANS

[Means for Solving the Problem] In order to attain the above-mentioned object, a cell pack according to claim 1 In the cell pack which made said housing outside surface expose the terminal which held the power limiter and cell which have a power-restrictions component in the housing constituted by attaching a case body and a case lid, and was connected to this cell through said power limiter at the serial It was filled up with the elastomer at least in said housing between this housing inner surface and the power-restrictions component of said power limiter, and said power-restrictions component was covered with this elastomer.
[0006] Moreover, the cell pack according to claim 2 was constituted in the mode which comes to carry out parallel connection of two or more resistance by which said power-restrictions component separated spacing to the substrate, and was arranged.
[0007] Moreover, the manufacture approach of the cell pack concerning invention according to claim 3 After attaching in a case body the cell by which the substrate with which the power-restrictions component was mounted was attached to the cell, and this substrate was attached, a wrap case lid is fixed to this case body for said cell and power-restrictions component. Subsequently After pouring in the elastomer from the inlet formed in either [at least] said case body or said case lid and filling up the surroundings of said power-restrictions component with this elastomer, it was made to blockade said inlet by plug part material.

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OPERATION

[Function] Since the surroundings of power-restrictions components, such as a resistor, are filled up with an elastomer, reliable explosion protection nature is attained since this elastomer is isolated from the exterior in a power-restrictions component, and an elastomer controls the backlash of a power-restrictions component etc., the cell pack concerning invention according to claim 1 can have an unnecessary fastener to prevention of the backlash of a power-restrictions component, can simplify a internal structure to it, and can also lessen the number of erectors at the time of manufacture further.
[0009] And since the cell pack concerning invention according to claim 2 carries out parallel connection of two or more small resistors etc., the small cheap resistor which circulates widely can be used, and the heat dissipation property which could distribute the generation of heat as these power limiter, and was excellent is acquired, and it can attain a miniaturization as the whole cell pack further.
[0010] Moreover, since the manufacture approach of the cell pack concerning invention according to claim 3 pours in an elastomer where it could perform assembly (manufacture) and a wrap case lid is fixed to a case body for said cell and power-restrictions component, and it fills up the surroundings of a power-restrictions component with it, without taking immobilization of a power-restrictions component into consideration, its shaping of an elastomer etc. is unnecessary and it can perform restoration easily.

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EXAMPLE

[Example] Hereafter, the example of this invention is explained with reference to a drawing. Drawing 5 shows the cell pack concerning one example of this invention from drawing 1 , and, for a top view and drawing 3 , the A-A view sectional view of drawing 2 and drawing 4 are [drawing 1 / a decomposition perspective view and drawing 2 / the B-B view sectional view of drawing 2 and drawing 5] electrical diagrams.
[0012] In drawing 1 -4, a case body abbreviation rectangle plate-like in 10 and 20 are the case lids of the shape of an abbreviation rectangular pipe in which the whole surface carried out opening, and these case body 10 and the case lid 20 are fabricated with injection molding of ABS plastics etc. The fitting protruding line 11 is formed in an inner surface periphery, and the rectangle-like crevice 12 is formed in an inner surface 1 side, a front flesh side is penetrated to this crevice 12, and two terminal derivation holes 13 and 14 and impregnation holes 15 carry out opening to the case body 10. The case lid 20 is energized with a spring 22 in this lock hole 21 by a 1 side outside surface's projecting and forming the lock hole 21 in this projection part, and the lock button 23 for immobilization to the body of a walkie-talkie etc. is held. These case body 10 and the case lid 20 constitute the cell pack housing with which the opening edge of the case lid 20 is attached in the fitting protruding line 11 of the case body 10, and holds the group cell 30 and the load limitation circuit (load limitation machine) 40. In addition, in drawing 1 , 19 is plug part material which blockades the impregnation hole 15, and the impregnation hole 15 is blockaded by the plug part material 19 after impregnation of an elastomer so that it may mention later.
[0013] The group cell 30 has four cell 31a of a rectangular parallelepiped configuration, and b, c and d (it represents with a number without a subscript hereafter), and these cells 31 are connected to a serial (refer to drawing 5). As for this group cell 30, three cell 31a, and b and c form the space S which 31d of cells is arranged on cell 31a at a plane, and the end face of these cells 31 is combined by the plate 32, respectively, and holds the load limitation circuit 40 between the case lids 20 on cell 31b and c. A plate 32 is fabricated by tabular from a fiber, FRP, etc., and is fixed to the electrode of the cell 31 by which the edge adjoins, respectively etc. In addition, it is also possible to constitute so that an electric conduction foil etc. may be formed in a plate 32 at the whole surface and each cell 30 may be connected electrically, and although it is not necessary to state, each cell 31 can also carry out parallel connection, and the number of cells 31 can also be set to arbitration.
[0014] In Space S, the load limitation circuit 40 is formed through an electric insulating plate 49 on cell 31b of the group cell 30, and c, and the surroundings of this load limitation circuit 40 are filled up with an elastomer 50. The load limitation circuit 40 prepares five metal coat fixed-resistors (load limitation component) 42a, b, c, d and e, and two terminal 43a and b (it represents with the number which does not have a subscript if needed) in a printed circuit board 41, and is constituted, and two places of a conductive part (a slash is attached and an insulating part is shown) are connected with the electrode of plus of the group cell 30, and minus by the lead member 47, respectively. On a printed circuit board 41, a metal film resistor 42 separates predetermined spacing, and is put in order and arranged, and parallel connection is carried out (refer to drawing 5). [each other] Terminals 43a and b separate spacing and expose the flank of cell 31c to the exterior from the terminal derivation holes 13 and 14 extended and mentioned above to the case body 10 side in parallel. Among these terminals 43a and 43b, the gap (it is described as a free passage way for convenience) which opens for free passage the impregnation hole 15 mentioned above in the side part of cell 31c and Space S is formed.
[0015] In addition, although the load limitation circuit 40 mentioned above consists of five metal coat fixed resistors 42, this metal coat fixed resistor 42 is possible also for substituting other wire wound resistors etc., and can also set that number to arbitration in the two or more range. Moreover, although a graphic display and detailed explanation are omitted, it is also possible to carry out opening of the hole for [to the

location of the impregnation hole 15 and an opposite hand] the air vents at the time of elastomer 50 restoration in the space S mentioned above. Furthermore, the inlet 15 mentioned above can also be formed [also forming in the case lid 20, and also] in the both sides of the case body 10 and the case lid 20.

[0016] An elastomer 50 is constituted so that it may consist of thermoplastic elastomer, such as a styrene system, an olefin system, or a vinyl chloride system, and it may consist of things of the silicone system excellent in thermal conductivity desirably and it may have big heat capacity desirably. It fills up with this elastomer 50 in Space S, and it covers the printed circuit board 41 table flesh side, especially its metal coat fixed resistor 42 of the load limitation circuit 40. This elastomer 50 is poured in from the impregnation hole 15, and it fills up with it in Space S through the free passage way between terminal 43a mentioned above and 43b so that it may explain in full detail behind.

[0017] In addition, the covering device material which 18 become from ABS plastics etc., and 27 and 28 are spacers which consist of a bakelite etc. among drawing.

[0018] If it is in this example, it is assembled in the following procedures. First, the load limitation circuit 40 is attached to the group cell 30, and it is wired. That is, on cell 31b and c, the lead member 45 is soldered to the conductive part of installation and a printed circuit board 41, and the printed circuit board 41 in which the metal coat fixed resistor 42 of the load limitation circuit 40 was mounted is connected with the group cell 30. In addition, although it is sufficient even for even laying a printed circuit board 41 through an electric insulating plate 49 on the group cell 30 at this time, it is also possible to fix a substrate 41 to the group cell 30.

[0019] Next, the group cell 30 by which the load limitation circuit 40 was attached is fixed on the case body 10, and the case lid 20 is fixed on the case body 10 installation and after this. That is, apply adhesives to the protruding line 11 grade of the case body 20, opening of the case lid 20 is made to attach in this protruding line 11, and it pastes up with adhesives. Subsequently, an elastomer 50 is poured in from the inlet 15 of the case body 10. Here, the elastomer 50 poured in from the inlet 15 flows in Space S through the free passage way between terminal 43a and 43b, is filled up with the inside of Space S, and covers the substrate 41 metallurgy group coat fixed resistor 42 of the load limitation circuit 40. Then, the plug part material 19 is attached in an inlet 15, and an inlet 15 is blockaded. Therefore, an elastomer 50 can be manufactured without taking shaping etc. into consideration, and the manufacture can be performed by easy and small manday.

[0020] And the cell pack manufactured as mentioned above Five metal coat fixed resistors 42 are pressed down by the elastomer 50 with which it filled up in Space S. A mutual interference, a backlash, etc. are prevented, can prevent generating of the spark resulting from these backlashs etc. certainly, and high explosion protection nature is obtained. moreover, since the metal coat fixed resistor 42 is isolated from the exterior by the elastomer 50, reliable explosion protection nature obtains -- having -- further -- immobilization of the metal coat fixed resistor 42 -- public funds -- an implement is unnecessary, and assembly is also easy, as cutback of components mark and simplification of a internal structure can be attained and being mentioned above.

[0021] Moreover, this cell pack can use the resistor 42 which the heat dissipation property which could distribute generation of heat of the load limitation circuit 40, and was excellent is acquire in order to carry out parallel connection of the five metal coat fixed resistors 42 and to use them, it can miniaturize, and a big degree of freedom is further obtain by the design of the configuration of a housing etc., and also circulates widely, and can attain shortening of a delivery date, and low cost-ization.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the decomposition perspective view of the cell pack concerning one example of this invention.
[Drawing 2] It is the top view of this cell pack.
[Drawing 3] It is the A-A view sectional view of drawing 2 .
[Drawing 4] It is the B-B view sectional view of drawing 2 .
[Drawing 5] It is the electrical diagram of this cell pack.
[Description of Notations]
10 Case Body
15 Inlet
19 Plug Part Material
20 Case Lid
30 Group Cell
31 Cell
32 Plate
40 Load Limitation Circuit (Load Limitation Machine)
41 Printed Circuit Board
42 Metal Coat Fixed Resistor
43 Terminal
50 Elastomer
S Space

[Translation done.]

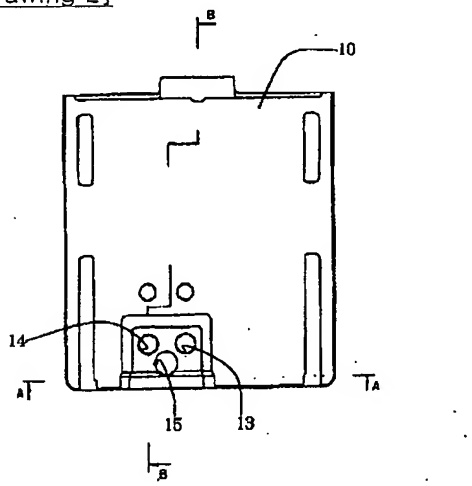
* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.

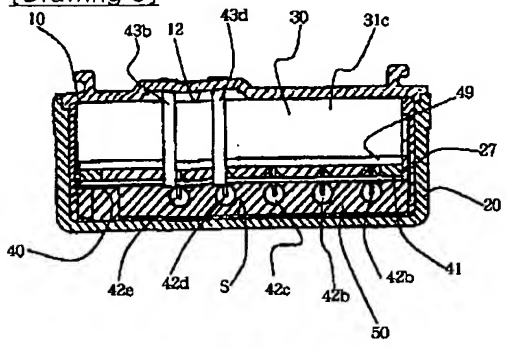
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

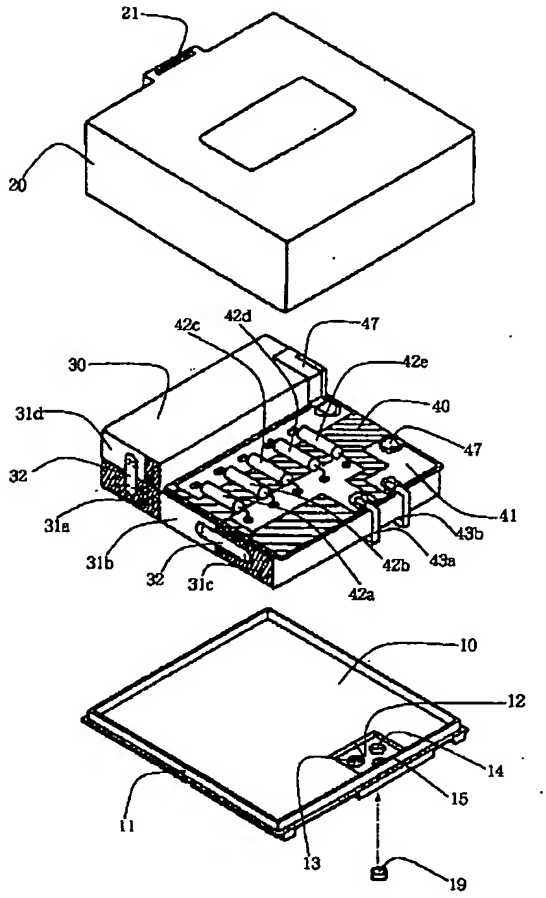
[Drawing 2]



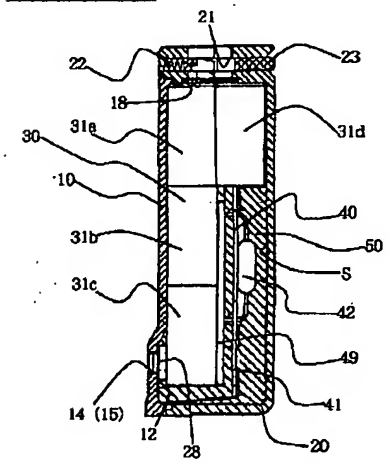
[Drawing 3]



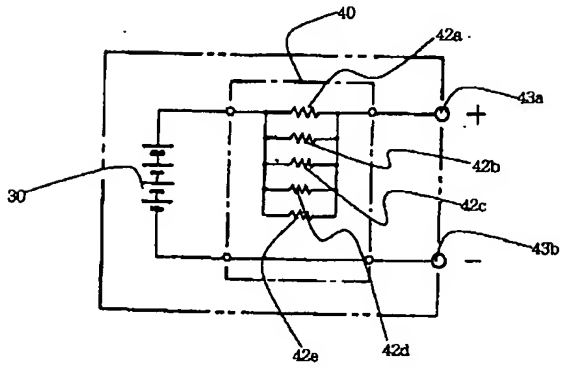
[Drawing 1]



[Drawing 4]



[Drawing 5]



[Translation done.]